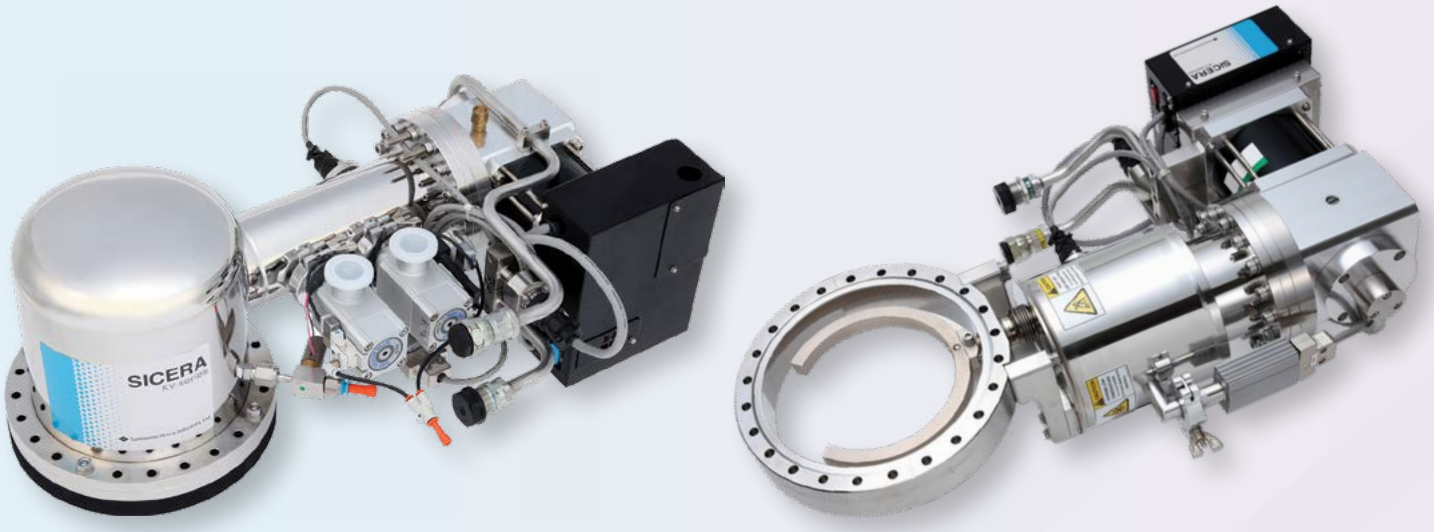
SICERA® CRYOPUMPS AND COLD TRAPS

Striking a balance between higher productivity and energy savings



Sumitomo Heavy Industries, Ltd.

SICERA® systems from Sumitomo Heavy Industries, Ltd. (SHI) deliver the performance, reliability, and energy efficiency that today's semiconductor fabs and research environments demand. Proven in PVD, ion implantation, and other high-vacuum applications, SICERA systems are engineered for seamless integration, long run times, and reduced total cost of ownership.

Why SICERA?

- Perfect for high-vacuum systems in research and vacuum coating applications
- Proven performance in PVD and ion implant tools
- Trusted by OEMs and end-users for field upgrades and retrofits
- SHI's global service and support network ensures long-term value
- Environmentally conscious design with significant energy savings

SICERA® Smart and Ultra Cryopumps

Next-Generation Performance for Research and High-Volume Manufacturing

SICERA Cryopumps leverage proprietary inverter-driven cryocoolers, unique warm-up technology, and intelligent system design to deliver industry-leading performance with reduced environmental impact.

- Operate up to 11 8-inch pumps on a single compressor[1]
- Ultra models deliver up to an additional 30-40% energy savings over the already-efficient Smart models[2]
- Self-diagnostics and independent safety valves increase reliability
- Patented regeneration sequence enables reduced regeneration time and improves reliability
- Designed for optimal H_2 pumping in ion implant tools

SICERA® Ultra Cold Traps

Efficient Water Vapor Management with Compact, Flexible Design

SICERA Ultra Cold Traps are engineered to enhance water vapor pumping efficiency in high-vacuum systems, complementing turbomolecular pumps and reducing overall system load. Whether installed directly inside the chamber or between the chamber and turbopump, each model uses SHI's dual-inverter technology, for greater productivity and energy savings.

- Space-saving in-line models install without additional ports
- In-situ option maximizes trapping efficiency directly in the chamber
- Dual-inverter technology enables mixed configurations on one compressor
- Simple integration with existing vacuum systems

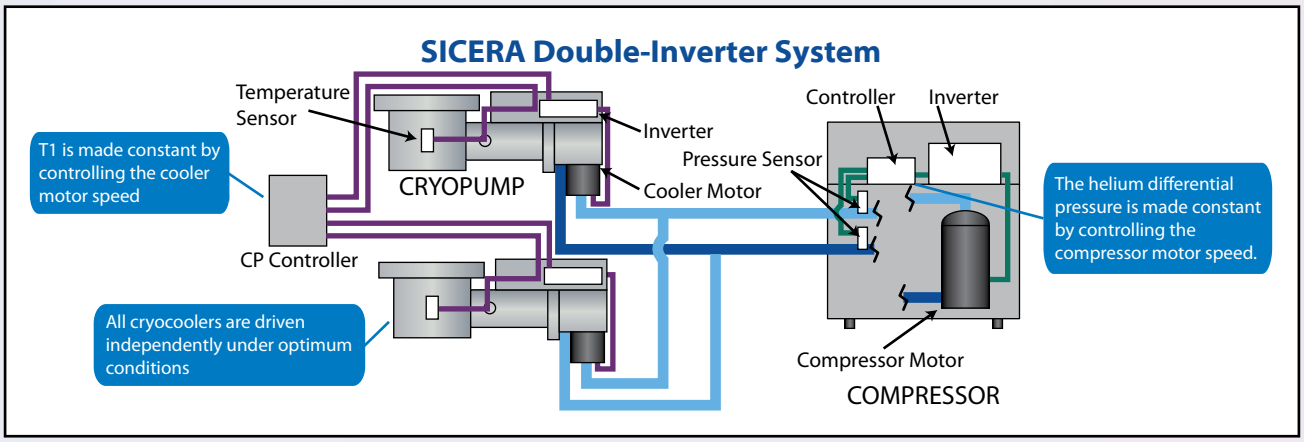
SICERA® Helium Compressors

Powering Performance with Intelligence

SICERA compressors use inverter control to match real-time demand and reduce energy draw.

- Supports up to 11 cryopumps or mixed cold trap configurations[1]
- No chiller required—runs on 32 °C cooling water at 9 L/min flow rate
- Easy integration into existing facility infrastructure

1 Up to 11 pumps with SICERA Ultra; up to five pumps with SICERA Smart. Dependant on tool configuration, specifications, and process conditions.
2 30-40% energy savings noted with use of 8-inch SICERA Ultra vs. 8-inch SICERA Smart Cryopumps in PVD applications. Energy savings with other sizes and applications may vary.



SICERA® SMART CRYOPUMPS



Model		Smart KZ-08 for PVD
Pumping Speed	Water	4,000 liters/second
	Argon	1,200 liters/second
	Nitrogen	1,500 liters/second
	Hydrogen	2,200 liters/second
Throughput	Argon	1.2 Pa•m³/s (700 sccm)
Capacity	Argon	1,000 standard liters
	Hydrogen	12 standard liters
Crossover Rating		20.0 Pa•m³
Base Pressure		<5E^{-7} Pa
Cooldown Time[1]		≤70 Minutes
Warmup Time[1]		≤30 Minutes
Weight		28 kg (61.7 lbs.)
Dimensions (LxWxH)		613 x 397 x 247 mm (24.1 x 15.6 x 9.7 in.)
Inlet Flange		ICF253
Maintenance		12,000 Hours



Model		Smart KZ-10 for PVD	Smart KZ-10 for Ion Implant
Pumping Speed	Water	6,500 liters/second	
	Argon	1,900 liters/second	1,990 liters/second
	Nitrogen	2,300 liters/second	2,650 liters/second
	Hydrogen	1,800 liters/second	6,360 liters/second
Throughput	Argon	1.2 Pa•m³/s (700 sccm)	1.0 Pa•m³/s (600 sccm)
Capacity	Argon	2,000 standard liters	-
	Hydrogen	16 standard liters	24 standard liters
Crossover Rating		20.0 Pa•m³	
Base Pressure		<1.0E^{-6} Pa	<5.0E^{-6} Pa
Cooldown Time[1]		≤85 Minutes	≤130 Minutes
Warmup Time[1]		≤45 Minutes[2]	≤35 Minutes[3]
Weight		26 kg (57.3 lbs.)	28 kg (61.7 lbs.)
Dimensions (LxWxH)		631 x 493 x 239 mm (24.8 x 19.4 x 9.4 in.)	632 x 460 x 279 mm (24.9 x 18.1 x 11.0 in.)
Inlet Flange		ISO 250 (clamped flange connection)	
Maintenance		12,000 Hours	

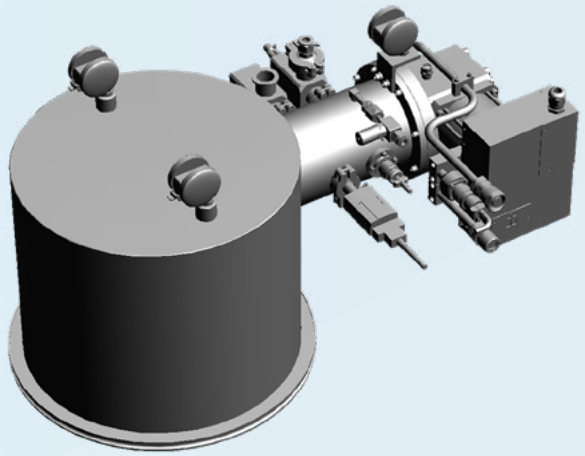
1 Regardless of number of cryopumps operating.
2 The supply pressure of the N2 purge is 0.55MPaG. There are no condensed gasses.

3 Warmup time to 280 K, if gas is not absorbed.
Specifications subject to change without notice

SICERA® SMART CRYOPUMPS



Model		Smart KZ-12 for PVD	Smart KZ-12 for Ion Implant
Pumping Speed	Water	11,000 liters/second	
	Argon	3,000 liters/second	3,470 liters/second
	Nitrogen	3,600 liters/second	4,470 liters/second
	Hydrogen	4,800 liters/second	11,330 liters/second
Throughput	Argon	0.8 Pa•m^3/s (500 sccm)	1.5 Pa•m^3/s (900 sccm)
Capacity	Argon	5,000 standard liters	-
	Hydrogen	16 standard liters	35 standard liters
Crossover Rating		20.0 Pa•m^3	
Base Pressure		<1.0E^{-6} Pa	<5.0E^{-6} Pa
Cooldown Time[1]		≤130 Minutes	≤170 Minutes
Warmup Time[1]		≤60 Minutes[3]	≤35 Minutes[3]
Weight		53 kg (116.8 lbs.)	32 kg (70.5 lbs.)
Dimensions (LxWxH)		735 x 509 x 392 mm (28.9 x 20.0 x 15.4 in.)	673 x 500 x 285 mm (26.5 x 19.7 x 11.2 in.)
Inlet Flange		ISO 320 (bolted flange connection)	ISO 320 (clamped flange connection)
Maintenance		12,000 Hours	



Model		Smart KZ-16 for PVD
Pumping Speed	Water	18,000 liters/second
	Argon	4,200 liters/second
	Nitrogen	5,000 liters/second
	Hydrogen	7,600 liters/second
Throughput	Argon	1.2 Pa•m^3/s (700 sccm)
Capacity	Argon	11,000 standard liters
	Hydrogen	28 standard liters
Crossover Rating		40.0 Pa•m^3
Base Pressure		<1.0E^{-6} Pa
Cooldown Time[1]		≤160 Minutes
Warmup Time[1]		≤65 Minutes[3]
Weight		59 kg (130.1 lbs.)
Dimensions (LxWxH)		793 x 522 x 446 mm (31.2 x 20.6 x 17.6 in.)
Inlet Flange		ISO 400 (clamped flange connection)
Maintenance		12,000 Hours



Model		Smart KZ-20 for PVD
Pumping Speed	Water	29,000 liters/second
	Argon	6,700 liters/second
	Nitrogen	8,000 liters/second
	Hydrogen	15,000 liters/second
Throughput	Argon	1.2 Pa•m^3/s (700 sccm)
Capacity	Argon	10,000 standard liters
	Hydrogen	56 standard liters
Crossover Rating		80.0 Pa•m^3
Base Pressure		<1.0E^{-6} Pa
Cooldown Time[1]		≤180 Minutes
Warmup Time[1]		≤85 Minutes[3]
Weight		78 kg (172.0 lbs.)
Dimensions (LxWxH)		894 x 572 x 413 mm (35.2 x 22.5 x 16.3 in.)
Inlet Flange		ISO 500 (clamped flange connection)
Maintenance		12,000 Hours

1 Regardless of number of cryopumps operating.
2 The supply pressure of the N2 purge is 0.55MPaG. There are no condensed gasses.

SICERA® ULTRA CRYOPUMPS



Model		Ultra KV-08 for PVD
Pumping Speed	Water	4,000 liters/second
	Argon	1,200 liters/second
	Nitrogen	1,500 liters/second
	Hydrogen	2,200 liters/second
Throughput	Argon	1.2 Pa•m³/s (700 sccm)
Capacity	Argon	1,600 standard liters
	Nitrogen	1,000 standard liters
	Hydrogen	12 standard liters
Crossover Rating		20.0 Pa•m³
Base Pressure		<5E⁻⁷ Pa
Cooldown Time[1]		≤75 Minutes
Warmup Time[1]		≤45 Minutes
Weight		28 kg (61.7 lbs.)
Dimensions (LxWxH)		613 x 397 x 230 mm (24.1 x 15.6 x 9.1 in.)
Inlet Flange		ICF253
Maintenance		12,000 Hours



Model		Ultra KV-10 for PVD
Pumping Speed	Water	6,500 liters/second
	Argon	1,900 liters/second
	Nitrogen	2,300 liters/second
	Hydrogen	1,800 liters/second
Throughput	Argon	1.2 Pa•m³/s (700 sccm)
Capacity	Argon	2,000 standard liters
	Hydrogen	16 standard liters
Crossover Rating		20.0 Pa•m³
Base Pressure		<5.0E⁻⁶ Pa
Cooldown Time[1]		≤85 Minutes
Warmup Time[1]		≤45 Minutes[2]
Weight		31 kg (68.3 lbs.)
Dimensions (LxWxH)		654 x 335 x 454 mm (25.7 x 13.2 x 17.9 in.)
Inlet Flange		ISO 250 (bolted flange connection)
Maintenance		12,000 Hours

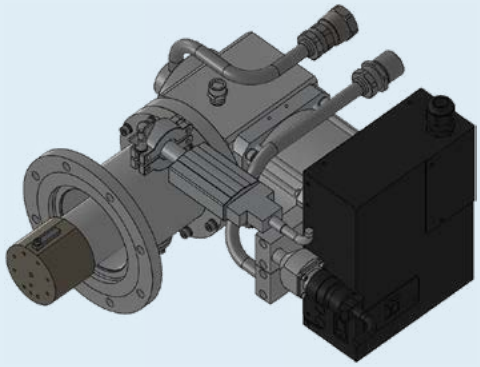


Model		Ultra KV-12 Low for Ion Implant	Ultra KV-12 High for Ion Implant
Pumping Speed	Water	11,000 liters/second	
	Argon	4,200 liters/second	4,300 liters/second
	Nitrogen	5,000 liters/second	5,200 liters/second
	Hydrogen	13,300 liters/second	15,000 liters/second
Capacity	Hydrogen	40 standard liters	45 standard liters
Crossover Rating		40.0 Pa•m³	
Base Pressure		<5.0E⁻⁶ Pa	
Full Regen Time[1]		<165 Minutes	<225 Minutes
Weight		40 kg (88.2 lbs.)	44 kg (97.0 lbs.)
Dimensions (LxWxH)		710 x 480 x 285 mm (28.0 x 18.9 x 11.2 in.)	710 x 480 x 350 mm (28.0 x 18.9 x 13.8 in.)
Inlet Flange		ISO 320 (clamped flange connection)	
Maintenance		12,000 Hours	

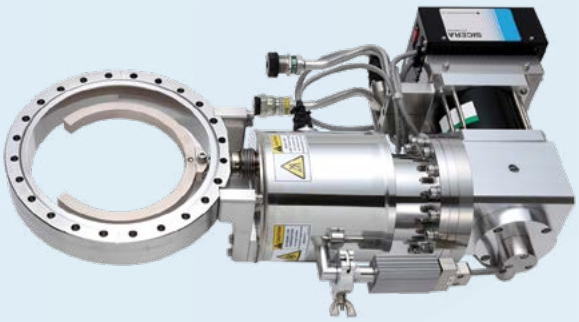
3 Warmup time to 280 K, if gas is not absorbed.
Specifications subject to change without notice

SICERA Ultra is not compatible with SICERA Smart.

SICERA® COLD TRAPS



Model	Ultra KV-04 In-Situ
Specifications	In-situ specifications may vary, depending on the size of the panel. Please contact SHI for more information on refrigeration capacity and other specifications.
Weight	20 kg (44.1 lbs.)
Dimensions (LxWxH)	318 x 592 x 285 mm (12.5 x 23.3 x 11.2 in.)
Inlet Flange	ISO 100 (chamber side; bolted flange connection)



Model	Ultra KV-08 In-Line (Thin Type)
Water Pumping Speed	2,400 liters/second
Nitrogen Conductance	1,600 liters/second
Argon Conductance	1,400 liters/second
Cooldown Time to 100 K	≤35 Minutes[3]
Warmup Time to 310 K	≤40 Minutes[3]
Weight	31 kg (68.3 lbs.)
Dimensions (LxWxH)	687 x 414 x 195 mm 27.0 x 16.3 x 7.7 in.)
Inlet Flange	ISO 200



Model	Ultra KV-10 In-Line
Water Pumping Speed	6,000 liters/second
Nitrogen Conductance	2,000 liters/second
Cooldown Time to 100 K	≤70 Minutes[1]
Warmup Time to 310 K	≤80 Minutes[2]
Weight	32 kg (70.5 lbs.)
Dimensions (LxWxH)	607 x 375 x 206 mm (23.9 x 14.8 x 8.1 in.)
Inlet Flange	ICF 305 (both sides; bolted flange connections)

1 There are no condensed gasses. The turbomolecular pump runs as usual during regeneration.
2 There are no condensed gasses.
3 Regardless of number of cryopumps operating.
Specifications subject to change without notice.

WATER-COOLED COMPRESSORS



Model	CSW-61C	CSW-61D
Electrical Supply	3 Phase 200-230 V, 50/60 Hz[1]	3 Phase 380-480 V, 50/60 Hz[2]
Ambient Temperature[4]	5-40 ºC (41-104 °F)	
Cooling Water (Inlet)	4-10 L/min. (1.1-2.6 gal./min.) 4-28 °C (39-82 °F)	
Dimensions(HxWxD)	594 x 451 x 747 mm (23.4 x 17.8 x 29.4 in.)	
Weight	130 kg (286.6 lbs.)	
Maintenance	30,000 Hours	



Model	TM-30L	TM-30H
Electrical Supply	3 Phase 200-230 V, 50/60 Hz[1]	3 Phase 380/400/415 V, 50 Hz 460/480 V, 60 Hz[2]
Ambient Temperature[4]	5-35 ºC (41-95 °F)	
Cooling Water (Inlet)	4-10 L/min. (1.1-2.6 gal./min.) 4-32 °C (39-90 °F)	
Dimensions(HxWxD)	596 x 451 x 747 mm (23.5 x 17.8 x 29.4 in.)	604 x 451 x 747 mm (23.8 x 17.8 x 29.4 in.)
Weight	140 kg (308.6 lbs.)	
Maintenance	30,000 Hours	



Model	TM-50L	TM-50H
Electrical Supply	3 Phase 200-230 V, 50/60 Hz[1]	3 Phase 380-480 V, 50/60 Hz[2]
Ambient Temperature[4]	5-35 ºC (41-95 °F)	
Cooling Water (Inlet)	4-10 L/min. (1.1-2.6 gal./min.) 4-32 °C (39-90 °F)	
Dimensions(HxWxD)	593 x 451 x 1177 mm (23.3 x 17.8 x 46.3 in.)	
Weight	170 kg (374.8 lbs.)	
Maintenance	30,000 Hours	

1 Voltage range is 180-253 V with zero tolerance.
2 Maximum number of cryopump connections is reduced when voltage range is 342-380 V.
3 Typical power consumption without heat load.
4 Cooling capacity may degrade if ambient temperature is above 28 °C (82 °F).
Specifications subject to change without notice.

For Information in:

Asia

Sumitomo Heavy Industries, Ltd.
ThinkPark Tower
1-1 Osaki 2-chome, Shinagawa-ku
Tokyo 141-6025
Japan
Phone: +81-3-6737-2550
Fax: +81-3-6866-5114
E-mail: shi.cryo@shi-g.com

Service Office
2-1-1, Yato-cho, Nishitokyo-city
Tokyo 188-8585
Japan
Phone: +81-42-468-4167
Fax: +81-42-468-4462

Sumitomo (SHI) Cryogenics Shanghai, Ltd.
Building 15, Lane 333
Zhujian Road, Minhang District
Shanghai 201107
P.R. China
Phone: +86-21-5486-6318
Fax: +86-21-5486-0065

Sumitomo (SHI) Cryogenics Korea, Co., Ltd.
3F, 280-3 Saneop-ro
155beon-gil, Gwonseon-gu,
Suwon-si, Gyeonggi-do 16648
South Korea
Phone: +82-31-278-3050
Fax: + 82-31-278-3053
E-mail: sales@shicryogenics.co.kr
service@shicryognics.co.kr

Sumitomo (SHI) Cryogenics Taiwan Co., Ltd.
4th Floor, No.3
Lane 216, Gongyuan Road
Hsinchu City 300031
Taiwan R.O.C
Phone: +886-3-561-2557, +886-3-561-2101
Fax: +886-3-562-3400
E-mail: chikai.yang.a@shi-g.com

United States

Sumitomo (SHI) Cryogenics of America, Inc.
1833 Vultee Street
Allentown, PA 18103
Phone: +1-610-791-6700
Fax: +1-610-791-0440
E-mail: scai.at.sales@shi-g.com
scai.fs.service@shi-g.com

Sumitomo (SHI) Cryogenics of America, Inc.
121 Daggett Drive
San Jose, CA 95134
Phone: +1-408-736-4406

Europe

Sumitomo (SHI) Cryogenics of Europe, Ltd.
3 Hamilton Close, Houndmills Industrial Estate
Basingstoke, Hampshire RG21 6YT
United Kingdom
Phone: +44 (0) 1256 853333
Fax: +44 (0) 1256 471507
E-mail: uksales@shicryogenics.co.uk
ukservice@shicryogenics.co.uk

Sumitomo (SHI) Cryogenics of Europe, GmbH
Daimlerweg 5a
Darmstadt D-64293
Germany
Phone: +49 (0) 6151 860 610
Fax: +49 (0) 6151 8606 1296
E-mail: sceg.contact@shi-g.com

Visit us anytime, worldwide: shicryogenics.com

© Sumitomo Heavy Industries, Ltd. 8/26